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TWO NEW EPIPHYTIC SPECIES OF *LYCOPODIUM* (LYCOPODIACEAE) FROM NORTH-EASTERN QUEENSLAND

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Summary

Lycopodium lockyeri and *L. marsupiiforme* are described as new. A key to the ten epiphytic species of *Lycopodium* in Australia is given.

In the course of studies on the pteridophytes of tropical Australia it became apparent that two undescribed epiphytic species of *Lycopodium* occur in north-eastern Queensland. Both species belong to the subgenus *Selago*.

Lycopodium lockyeri D. Jones et B. Gray, species nova affinis *L. carinato* Desv. sed foliis membranaceis, atroviridis, non carinatis et facientibus angulum 60°–80° cum axe differt. **Typus.** Cook District: S.F.R. 143, Parish of Riflemead, North Mary Logging Area, 16° 32'S, 145° 16'E, 30 Aug 1984, *B. Gray* 3541, 1200 m, epiphyte on side of granite boulder in shaded, humid position (holotypus, QRS; isotypi, BRI, NSW).

An epiphyte forming dense clumps. Stems at first erect, becoming pendulous as they lengthen, up to 40 cm long, branching dichotomously 1–4 times in the distal half; sterile portion about 2 cm diameter including the leaves. Sterile leaves 10–14 mm long, 2.5–5 mm wide, lanceolate to narrow-ovate, thin-textured but firm, dark green, crowded, arranged in 6 rows in whorls of 3, making a wide angle (60°–80°) with the axis, decurrent along the stem, the margins entire, the apex acute to acuminate. Transition from sterile to fertile zone gradual, the fertile region 4–8 cm long, 4–6 mm diameter. Fertile leaves (sporophylls) 5–7 mm long, 2 mm wide, oblanceolate, tapering abruptly in the distal three-quarters, crowded, decurrent, keeled, imbricate, held at an angle of 35°–40° to the axis, the margins entire, the apex acute. Sporangia about 1.6 mm across, reniform, bright yellow, situated in the basal one-quarter of the sporophyll. **Fig. 1.**

Collections examined. Cook District: S.F.R. 144, Bowerbird Logging Area, Spencer Creek, 16°15'S, 145°01'E, 1000 m, Jan 1985, *R.L. Lockyer* s.n., rainforest, on tree; & *R.L. Lockyer* s.n., growing on granite boulder; S.F.R. 607, Emerald Logging Area, 17°10'S, 145°40'E, 1200 m, Jul 1971, *A.W. Dockrill* 160, rainforest, lithophyte; (all BRI & QRS).

Distribution: North-eastern Queensland between Windsor Tableland and the Lamb Range, above 1000 m altitude.

Habitat: On trees or rocks in rainforest.

Affinities: *L. lockyeri* is close to *L. carinatum* Desv. but differs in its dark green, thinner-textured leaves which are not keeled. It also has affinities with *L. myrtifolium* G. Forster but this species has bright green, almost lustrous sterile leaves which spread at 90° or even more to the axis. It is superficially similar to *L. phlegmaria* L. but this species has an abrupt change between sterile and fertile stem sections.

Etymology: The specific epithet is in honour of Mr Reg Lockyer, log buyer, from Ravenshoe who discovered this species and has many other notable fern finds to his credit.

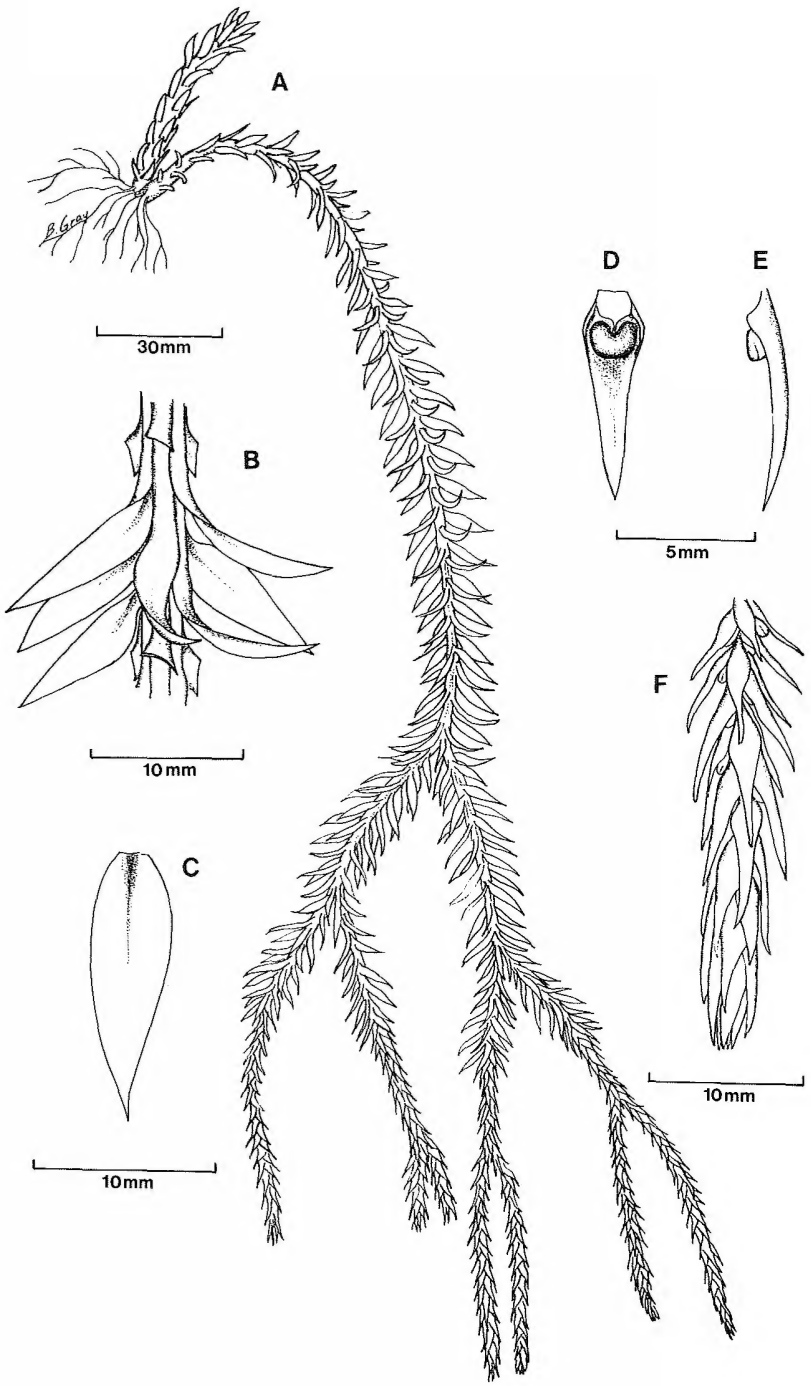

Fig. 1. *Lycopodium lockyeri*: A. habit. B. portion of sterile stem. C. sterile leaf (adaxial view). D. & E. sporangium and supporting sporophyll (D, adaxial view; E, side view). F. portion of fertile stem. All drawn from type collection.

Lycopodium marsupiiforme D. Jones et B. Gray, species nova affinis *L. prolifero* Blume sed zona transitionis inter steriles et fertiles sectiones abrupta et sterilibus foliis non carinatis, obtusis et facientibus angulum 45°–90° cum axe differt. **Typus.** Cook District: S.F.R. 143, Parish of Riflemead, North Mary Logging Area, 16°32'S, 145°16'E, 3 Jan 1985, *B. Gray* 3841, 1000 m, rainforest, epiphyte on trunk of tree (holotypus, QRS; isotypi, BRI, NSW).

Epiphyte forming slender clumps. Stems pendulous, up to 60 cm long, branching dichotomously once to several times; sterile portion 10–14 mm diam., including the leaves. Sterile leaves 5–6 mm long, 1.8–2 mm wide, ovate, thin-textured but firm, light green to yellowish, crowded but not overlapping, arranged in 4 rows in staggered pairs, making an angle of 45°–90° to the axis, flat and not folded or keeled, decurrent at the base, the margins entire, the apex obtuse. Transition from sterile to fertile zone abrupt, the fertile region 5–25 cm long, about 2 mm diameter, once to several times forked. Fertile leaves (sporophylls) 2.5–3.5 mm long, 1.5–1.8 mm wide, diamond-shaped to broadly rhombic, with a small pocket near the base, tapering abruptly in the distal half, crowded, decurrent, keeled, closely imbricate, held at an angle of less than 25° to the axis, the margins entire, the apex blunt. Sporangia about 1 mm across, reniform, bright yellow. **Fig. 2.**

Collections Examined: Cook District: S.F.R. 144, Parish of Whypalla, Bowerbird Logging Area, 16°15'S, 145°01'E, 1200 m, Jan 1985, *B. Gray* 3842, rainforest, epiphyte on trunk of tree; S.F.R. 194, Parish of Western, 17°18'S, 145°25'E, 1100 m, Jan 1985, *B. Gray* 3486, rainforest, epiphyte on trunk of fallen tree; S.F.R. 756, Solomon Logging Area, 17°59'S, 145°40'E, 840 m, Jan 1985, *R. Lockyer* s.n., rainforest; (all BRI & QRS).

Distribution: North-eastern Queensland between Windsor Tableland and south of the Tully River, above 800 m altitude.

Habitat: On mossy trees or rocks in high altitude rainforest, often growing in the base of other epiphytes.

Affinities: *L. marsupiiforme* is closest to *L. proliferum* Blume but can be easily distinguished by its less crowded, blunt, sterile leaves which spread at a wide angle to the stem and also the sudden transition from the sterile portion to the fertile portion. It also has similarities to *L. phlegmaria* L. but has a much more slender growth habit than that species and blunt rather than pointed leaves.

Etymology: The epithet refers to the small pocket on the sporophylls below the sporangia.

KEY TO THE AUSTRALIAN EPIPHYTIC SPECIES OF *LYCOPODIUM*

1. Fertile and sterile leaves similar in shape, size and arrangement 2
   Fertile and sterile leaves markedly dissimilar 3

2. Whole plant prominently glaucous ..... **L. dalhousieanum** Spring
   Whole plant yellowish green ..... **L. squarrosum** G. Forster

3. Transition from sterile to fertile stem section gradual, the fertile leaves gradually becoming smaller towards the apex of the stem 4
   Transition from sterile to fertile stem section abrupt, all the fertile leaves of a similar size and much smaller than the sterile ones 8

4. Sterile leaves less than 5 mm long ..... **L. polytrichoides** Kaulf.
   Sterile leaves more than 10 mm long 5

5. Fertile leaves spreading and loosely overlapping ..... **L. lockyeri** D. Jones & B. Gray
   Fertile leaves appressed and tightly overlapping 6

6. Sterile leaves widely spreading at an angle of about 90° to the stem ..... **L. myrtifolium** G. Forster
   Sterile leaves not widely spreading, making an angle of 30–45° to the stem 7

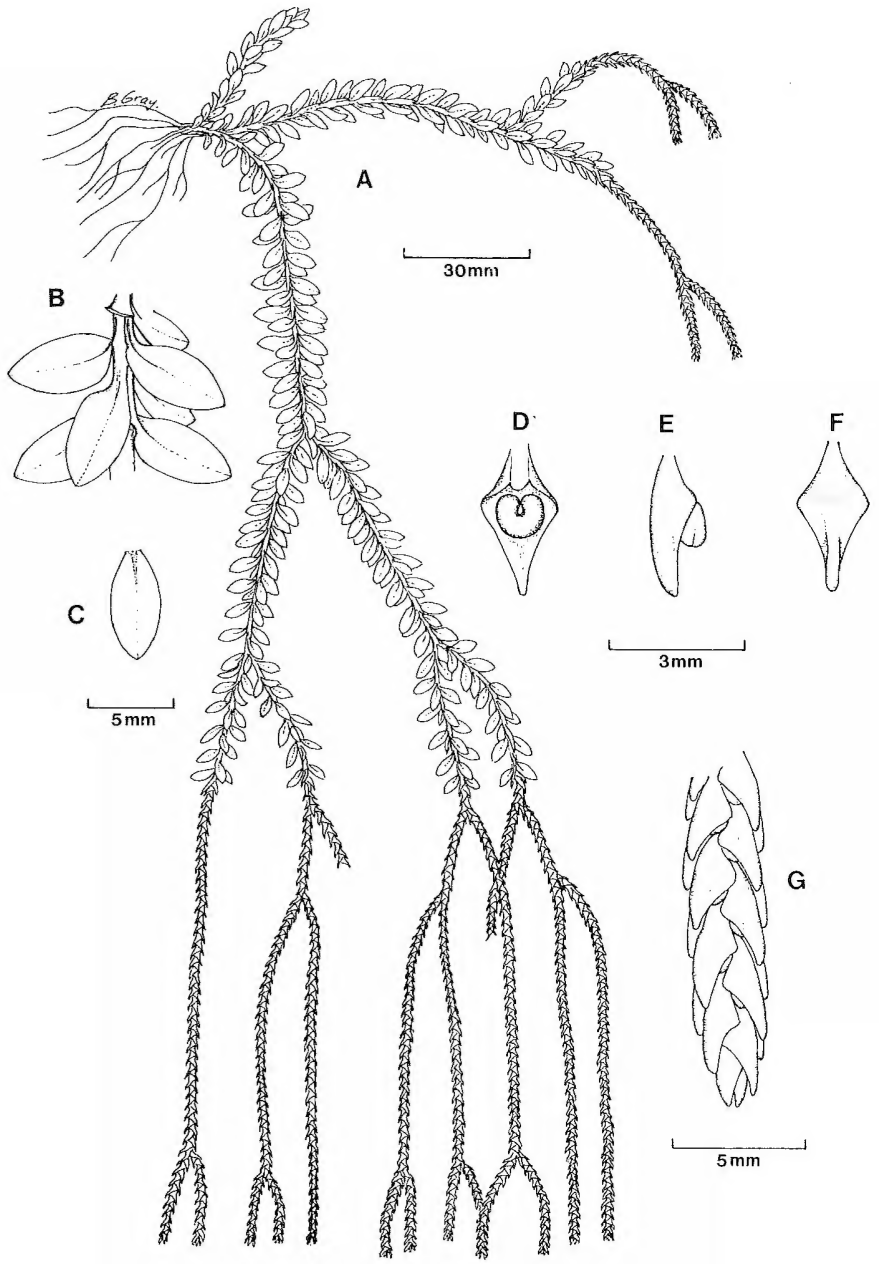

Fig. 2. *Lycopodium marsupiiforme*: A. habit. B. portion of sterile stem. C. sterile leaf (adaxial view). D, E & F. sporangium and supporting sporophyll (D, adaxial view; E, side view; F. abaxial view). G. portion of fertile stem. All drawn from type collection.

7. Sterile leaves thick, rigid, 2 mm wide (lowland species) ..... **L. carinatum** Desv.
   Sterile leaves thin-textured, not rigid, 3–4 mm wide (highland species)
   .....**L. proliferum** Blume

8. Sterile leaves with a blunt, rounded apex ..... **L. marsupiiforme** D. Jones & B. Gray
   Sterile leaves with an acute or acuminate apex 9

9. Sterile leaves in 4 regular, longitudinal rows, spreading at an angle of
   about 30° to the stem ..... **L. phlegmarioides** Gaudich.
   Sterile leaves in a spiral or in whorls, spreading at an angle of 50–90° to
   the stem ..... **L. phlegmaria** L.

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